

ETHOXYQUIN as anti-oxidant in fish feeds - FACTS

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Introduction

Concerns have been reported in different media on the presence of the antioxidant feed additive *ethoxyquin* (E324) in farmed fish, thereby speculating that eating such fish could be unhealthy. This fact sheet aims to clarify the position of the use and effects of ethoxyquin.

What is ethoxyquin ?

Ethoxyquin is a quinoline-based antioxidant. Antioxidants are commonly used in the feed and food industry to protect the raw materials and final products against oxidation (rancidity). In general, these are used to protect oil and fat products, vitamins and amino acids so as to avoid nutrient deficiencies in feeds.

Why use ethoxyquin ?

Fish meal and fish oil used in fish feed manufacture are very rich in highly unsaturated fatty acids. These materials are highly sensitive to oxidation and, thus, require protection.

It is a legal requirement of the International Maritime Organisation (IMO) to add the anti-oxidant to fishmeal - prior to shipping - to ensure safe transportation and storage of this product.

EU regulation/position

Ethoxyquin (E324) was authorised as a feed additive as antioxidant for all species under the conditions of Directive 70/524ⁱ but with a limitation on the quantity to be used in feed. The European Union set a combined upper limitⁱⁱ for ethoxyquin and other antioxidants (BHAⁱⁱⁱ and BHT) of 150mg per kg of feed, with obligatory labelling conditions. The Food and Agriculture Organisation (FAO) of the United Nations published a list^{iv} of commonly-used chemical preservatives that are generally recognized as being safe, including ethoxyquin, for use in fish feeds. Ethoxyquin has been demonstrated to be the most efficacious, followed closely by BHT and BHA.

As an authorised additive, it is subject to the re-evaluation procedure under EU Regulation 1831/2003^v. Ethoxyquin was considered by the European Commission as one of the priority substances in its re-evaluation process, in agreement with the European Food Safety Authority (EFSA). Following a request for re-authorisation of ethoxyquin in feed, a scientific assessment by EFSA is ongoing. During this assessment, all animal, human and environmental issues are checked and examined.

Currently, there are no Maximum Residues Limits (MRLs) for ethoxyquin in fish and fishery products and in other food of animal origin nor are there any restrictions in its use as feed additive; setting MRLs may be achieved, taking into account the outcome of the EFSA opinion.

Application of the organic agriculture Regulation^{vi} uses a list of positive feed additives in which ethoxyquin is not included.

Effects of ethoxyquin

As described, antioxidants prevent oxidative losses of essential nutrients in stored, mixed feeds used in the farming of fish. The benefits of consistent feed nutrient quality spans the processing and handling of feedstuffs and all facets of fish production.

Feeding trials on fish have shown that, in some instances, minimal levels of ethoxyquin are transferred from the feed to the flesh of the fish.

Some countries outside the EU have introduced legal threshold values for MRLs of ethoxyquin, which vary with the type of food and the country concerned. For example, the USA has adopted 0.5 mg/kg for meat and eggs, 3 mg/kg for chicken liver and 5 mg/kg for fat. In Japan, a MRL of 1.0 mg/kg is set for fish.

In a scientific study^{vii} made by NIFES (Norway), the highest concentration of ethoxyquin in salmon fillets was found to be 0.2 mg/kg while the average values in any individual year between 2005-2009 ranged between 0.02-0.04 mg/kg.

Analysis of ethoxyquin levels in other farmed fish species (including cod, salmon, halibut and trout) has shown that consuming fish with these levels of ethoxyquin contributes as little as 4% and up to 15% of the acceptable daily intake on the daily consumption of a 300 g. portion of fish.

Conclusions

Farmed fish that are reared with feeds containing fishmeal and the antioxidant ethoxyquin are safe to eat.

The amounts of ethoxyquin that we consume by eating farmed fish are negligible.

The EU regularly monitors the use and safety of all feed and food additives to ensure consumer safety.

ⁱ Council Directive 70/524/EEC of 23 November 1970 concerning additives in feeding-stuffs (English special edition: Series V Volume 1952-1972 P. 0080)

ⁱⁱ Regulation (EC) N° 767/2009

ⁱⁱⁱ Butylated hydroxyanisole (BHA) and the related compound butylated hydroxytoluene (BHT) are phenolic compounds that are often added to foods to preserve fats.

^{iv} <http://www.fao.org/docrep/X5738E/x5738e0b.htm>

^v Regulation (EC) N° 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition. OJ L 268, 18.10.2003, p. 29

^{vi} Regulation (EC) N° 834/2007

^{vii} <http://nifes.no/en/ethoxyquin-in-fish-feed/>